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Abstract of the Disclosure

The output level (vibration level) of vibration of a portion below the spring of a vehicle detected by a vibration sensor mounted to the portion below the spring of the vehicle is frequency converted by frequency analyzing means 14F to obtain the frequency spectrum of the vibration level and an operation is carried out on at least two vibration levels at different frequency bands of the obtained frequency spectrum by vibration level computing means 14R, and this computed value is compared with a master curve showing the frequency spectrum of vibration level stored in vibration level storage means 16S to estimate the condition of a road surface so as to estimate the running state of the vehicle.

Further, the running state of each tire including the air pressure of the tire is detected from the vibration level of the portion below the spring of the vehicle to estimate the running state of the vehicle, thereby constructing a multi-function sensing system for estimating the condition of a road surface or the running state of the tire with one sensor.